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THE ABORIGINAL USE OF TURQUOIS IN NORTH AMERICA¹

By JOSEPH E. POGUE

INTRODUCTORY

THE use of turquoise in North America, apart from its modern application in jewelry, has been confined to Central America, Mexico, and the southwestern portion of the United States, and within this territory it has been known and prized for centuries. At the time of the Spanish conquest there were, broadly speaking, three somewhat distinct groups of aborigines within this region: the Zuñi, Hopi, and allied tribes dwelling in pueblos in the elevated plateau of New Mexico, Arizona, and northern Mexico; the Nahuan tribes, commonly designated as Aztecs, with a higher degree of culture than the Indians to the north, occupying the mountainous region of Mexico; and the Maya, Quiché, and kindred peoples of Central America. In all three provinces the turquoise found both a religious and an ornamental use, and there are striking analogies between its application among widely separated tribes. With the passing of the ancient Nahuan and Mayan cultures, however, the use of the turquoise dwindled to unimportance south of the northernmost provinces of Mexico; but not so in the Pueblo region, where the mineral holds the same high place today that it did centuries ago.

The information concerning the use of turquoise by modern Indians is drawn from writings of ethnologists and other observers, and study of the objects themselves, a number of which are in the

¹ Published by permission of the Smithsonian Institution.

This paper is extracted from the manuscript of a forthcoming work in which the writer attempts to present the available information bearing on the history, ethnology, mythology, and folklore, as well as the mineralogy, geology, and technology of turquoise. He realizes that many facts of interest have escaped him, and will be grateful for suggestions and data, not only relative to the subject of this paper, but to turquoise in general.

ethnologic collections of the United States National Museum.¹ The evidence for deducing the application of turquoise among the ancient tribes is derived from two different and wholly independent sources: firstly, the objects now existing in various collections and available through accurate descriptions; secondly, the writings of the old Spanish chroniclers, who were first-hand observers of the actual conditions. A few words concerning the relative weight of the two classes of evidence: The first, in most instances, can hardly be questioned; the turquoise in the objects described has in many instances been identified as such by competent mineralogists. The historical evidence is more open to doubt: we cannot always be sure that the precious stone described as turquoise is really such. The descriptions of it are sometimes confusing and conflicting, and were the historical accounts the only basis the entire ancient use of turquoise might be open to reasonable doubt. So many turquoise objects are known, however, and some of these so closely fit the descriptions of the old writers, that the historical evidence, by corroboration, assumes a weight it would not have alone and in the main can safely be accepted.

In the old Spanish writings there is frequent mention of a green precious stone prized by the Aztecs and called by them *chalchihuitl* (pronounced chal-che-we'-tl). This has been the subject of much discussion, some maintaining that it represents jade, others that it was turquoise, others that it was in part jade and in part turquoise, still others that the term included many varieties of green gems, and so on. This subject will receive special treatment elsewhere: it is possible here only to state the conclusions reached by the writer, namely, that the early writers confused several green stones under this term; the natives, however, used it more strictly to designate one of their most valued precious stones, in the Southwest this being turquoise, in Mexico and Central America probably jade. The uses of *chalchihuitl* and turquoise were very similar, and in discussing the latter an occasional allusion to the former cannot be avoided.

¹ The writer had occasion to spend three months among the Navaho and Hopi of northern Arizona in 1910 and was afforded good opportunity to observe the use of turquoise among these tribes. He has also inspected with profit the ethnologic collections in the British Museum and the Berlin Museum of Ethnology.

It may be useful to bear in mind the relative, rather than the absolute, antiquity of the races which have used turquois.¹ For example, the culture of Mexico at the time of the conquest was more archaic than that of Egypt under the Pharaohs, and certain of the tribes of our Southwest, the Hopi, for example, are almost as primitive today as the dwellers in the lake-villages of Switzerland during Neolithic times.

THE USE OF TURQUOIS IN MEXICO AND CENTRAL AMERICA
Use as Attested by Historical Evidence

The first European to come in contact with turquois in the New World was probably Juan de Grijalva, the discoverer of Yucatan. According to Gomara,² he secured by barter from the natives of this country in 1518 three gilded masks of wood, covered with mosaics of turquois. It is not unlikely that one, if not all, of these is in existence today.³ Proceeding on the same expedition to San Juan de Ulloa, Grijalva obtained further ornaments from the natives, including four turquois-incrusted ear pendants and five gilded mosaic masks (nature of mosaics not described).

It was in the following year that Fernando Cortés made the first of a series of daring moves that so quickly resulted in the overthrow of the "Aztec Empire". It is related that upon landing at San Juan de Ulloa he was met by numbers of natives, of whom it was observed⁴ that "Among the rest or rather aloof from the rest were certain Indians of differing habit, higher than the other and had the gristles of their noses slit, hanging over their mouths, and rings of jet and amber hanging thereat: their nether lips also bored and in the holes rings of gold and Turkesse-stones⁵ which weighed so much that their lips hung over their chins leaving their teeth bare.

¹ For a good discussion of the degrees of culture embraced by the terms savagery, barbarism, and civilization, consult Fiske, *The Discovery of America*, Boston, 1892, vol. I, pp. 24-38.

² *Histoire générale des Indes Occidentales, et Terres Neuves*, French trans. by M. Fumée, Paris, 1606, pp. 64, 65.

³ See pages 450, 451.

⁴ Purchas, *Pilgrimes*, London, 1626, vol. v, book 8, chap. 9, p. 859, quoted by Dall, *3d Ann. Rep. Bur. Ethnol.*, 1881-82, p. 85.

⁵ The custom of wearing labrets of turquois was also practised in South America.

These Indians of this New Cut Cortez caused to come to him and learned that they were of Zempoallan a citie distant thence a dayes journey whom their Lord had sent; . . . being not subject to Montezuma but onely as they were holden in by force."

Cortés immediately dispatched envoys to enter into negotiations with Montezuma, ruler of the Aztecs, who returned ambassadors to the Spanish camp, bearing princely gifts. Sahagun¹ enumerates in detail these presents, and his inventory includes: (1) A mask, incrustated with a mosaic of turquois, carrying upon it a snake, coiled and twisted, worked of the same stone; (2) A bishop's crozier² all made of turquois in mosaic work, and terminating in a coiled snake's head; (3) Large earrings of chalchihuitl, in serpent design; (4) A mitre² of ocelot's skin, surmounted by a large chalchihuitl, and decorated with turquois mosaic, and (5) A staff² adorned with mosaic of turquois.

According to other accounts,³ Montezuma later sent further gifts, intended for the Spanish King, including four chalchihuitls, each, according to the estimates placed upon them by the Mexicans, "worth a load of gold." The identity of the four stones cannot be definitely settled. Kunz,⁴ however, remarks that "it is a well authenticated fact that the gems referred to were turquoises, and it is believed that they are among the crown jewels of Spain."

The Spaniards soon penetrated to the high plateau of Mexico and seized the personage of Montezuma. They found the turquois esteemed throughout the country, and the many uses to which it was put are recorded in the writings of their chroniclers.

The turquois was employed not only as an ornament, but found an important religious and ceremonial application as well. A

¹ *Histoire générale des choses de la Nouvelle-Espagne*, French trans. by Jourdanet and Siméon, Paris, 1880, pp. 799-800.

² These were among the insignia of Quetzalcoatl and their presentation to Cortés suggests that the latter was thought to be this fair-skinned god, returning from the east as had been prophesied. Mrs Nuttall (The Atlatl or Spear-thrower, *Peabody Museum Papers*, Cambridge, 1891, vol. 1, no. 3, pp. 21-23) deems these examples to be a form of atlatl, or spear-thrower, and states, "It appears that all three were sent to Europe."

³ Clavigero, *History of Mexico*, Cullen's trans., Phila., 1817, p. 282. *The Memoirs of Bernal Diaz*, Lockhart's trans., London, 1844, vol. 1, p. 93.

⁴ *Gems and Precious Stones*, New York, 1890, p. 63.

Nahuan king was interred with great pomp, a mask either painted or of gold, or of turquois mosaic, being placed over his face.¹ A pendant of turquois hung from the underlip of Topiltzin, the chief of six priests customarily engaged in human sacrifice;² "under the lip upon the midst of the beard hee had a peece like unto a small canon of Azured stone."³ In the month of Izcalli a feast was celebrated in honor of Xiuhtecutli,⁴ the God of Fire, and an image of this Aztec Vulcan was adorned in fine raiment; from its ears hung pendants wrought in mosaics of turquoises,⁵ and its left hand grasped a shield surmounted by five green chalchihuitl stones placed in the form of a cross upon a gold plate.⁶

Quetzalcoatl, Lord of the Winds, and the mysterious hero-god of the Mexicans, is supposed to have introduced the art of working precious stones.⁷ In the sacrifices and fetes held in his honor he is represented as wearing blue turquois earrings in mosaic.⁸ He was worshipped as the god of commerce by merchants who bought, sold, and worked in precious stones.⁹ According to tradition the palace of this personage was composed of four apartments, lavishly decorated; the easternmost one "called the hall of emeralds and turquoises, because its walls were embellished with stones of all kinds arranged in mosaics of wonderful perfection."¹⁰ Catmaxtli, the father of Quetzalcoatl, was adorned with a mask of turquois mosaic during the feast of Catmaxtli.¹¹

¹ Bancroft, *Native Races of the Pacific States of North America*, New York, 1874, vol. II, p. 606. "Speaking of the obsequies of Tezozomac of Azcapuzalco, Ixtlilxochitl says that a turquois mask was put over his face . . ." *Relaciones*, in Kingsborough, *Mex. Antiq.*, vol. 9, p. 370. Veytia states that it was a gold mask "garnecida de turquezas."—*Hist. Ant. Mej.*, tom. IV, p. 5.

² Clavigero, loc. cit., 1817, vol. II, p. 52.

³ Purchas, *Pilgrimes*, London, 1626, vol. v, book 8, chap. 9, p. 871, quoted by Dall. *3d Ann. Rep. Bur. Ethnol.*, 1881-82, p. 85.

⁴ *xiuill* = turquois, herb, year, or comet, and *teculli* = lord.

⁵ Sahagun, loc. cit., p. 27.

⁶ *Ibid.*, p. 50.

⁷ Torquemada, *Monarchia Indiana*, Madrid, 1723, vol. II, p. 48.

⁸ Sahagun, loc. cit., p. 16.

⁹ Peñafiel, *Monuments of Ancient Mexican Art*, Berlin, 1890, p. 12.

¹⁰ Sahagun, loc. cit., vol. 2, p. 656. See also Bancroft, loc. cit., vol. 2, p. 173. Emerson, *Indian Myths or Legends*, Boston, 1884, p. 9. Nuttall in *Peabody Mus. Papers*, Cambridge, 1901, vol. II, p. 294.

¹¹ Bancroft, loc. cit., vol. 2, p. 314.

Each Aztec god was represented as carrying some form of atlatl, as a symbol,¹ and these objects, fashioned in snake design and inlaid with turquoises, were in ceremonial use at the time of the conquest. In the great festival in honor of Quetzalcoatl, his high priest was preceded by a "mace-bearer with a sceptre shaped like a monstrous serpent, all covered with mosaic composed of turquoises."² Similar insignia were presented to Cortés by Montezuma, as has been noted. The serpent-shaped atlatl of the hero-god Huitzilopochtli was called *XiuatlAtl*, meaning blue or turquoise atlatl.³

The ornamental use of turquoise was no less interesting. Montezuma, as high-priest and representative of a god, wore necklaces of precious stones, fine and large, consisting of chalchihuitls and turquoises of finest quality.⁴ The latter, indeed, were of such value that they could be worn only by the first of the land. The dress of the nobles is thus described by Sahagun:⁵

"The Mexican lords wear wrist bands of black leather made pliable with balsam, and decorated with strings of chalchihuitl or other precious stones. They used to wear chin ornaments of chalchihuitl set in gold and implanted in the flesh. Some of the ornaments are large crystals with blue feathers in them, which gives to them the aspect of sapphires. They wear many other precious stones protruding through openings made in the lower lip. The noses of the great lords are also pierced and they wear in the openings fine turquoises and other precious stones, one on each side."

Annually the tribes under the dominion of Montezuma were required to pay tribute, including jewelry and ornaments of great value. As recorded in the "Book of Tribute" and translated by Peñafiel,⁶ these consisted of a "gold circle, gold diadem, gold necklace, pearls of chalchihuitl, masks of turquoise stone, turquoise stone not cut, stones of rock crystal with shades of blue and with gold mounting, pendants of beryl enamelled in blue, and with gold

¹ Nuttall in *Peabody Mus. Papers*, Cambridge, 1891, vol. 1, no. 3, p. 29.

² Sahagun, loc. cit., p. 169. See also Nuttall, 1891, loc. cit., p. 23.

³ Nuttall, 1891, loc. cit., p. 188.

⁴ Sahagun, loc. cit., p. 514. Nuttall in *Peabody Mus. Papers*, Cambridge, 1888, vol. 1, no. 1, pp. 1-52.

⁵ Loc. cit., p. 511.

⁶ *Monuments of Ancient Mexican Art*, Berlin, 1890, p. 79.

mounting, and plates mounted with turquoise stones." Included also therein, according to Clavigero,¹ were "ten small measures of fine turquoises and one cargo of ordinary turquoises." It is known from the Chronicle of Tezozomoc² that in the 15th century the Mexicans imported shields and ear-plugs bedecked with turquoise mosaics from the people of the Zapotecan tribes and accepted them as tribute.

Very little historical information is available regarding the nature and occurrence of the turquoise employed by the old Mexicans. Sahagun³ writes:

"The turquoise occurs in mines. There are some mines whence more or less fine ones are obtained. Some are bright, clear, fine and transparent; while others are not."

Again:

"Teoxiuitl is called turquoise of the gods. No one has a right to possess or use it; but it must always be offered or devoted to a divinity. It is a fine stone without any blemish and quite brilliant. It is rare and comes from a distance. There are some which are round and resemble a hazel-nut cut in two. These are called xihutomolli."⁴

In another place⁵ he says:

"There is another medicinal stone called xihutomoltetl (from *xihutomolli*, turquoise, and *tell*, stone), which is green and white at the same time like chalchihuitl. It is very beautiful. Its moistened scrapings are good for feebleness and nausea. It is brought from Guatemala and Xochonuchco. They make it into strings for hanging around the neck."⁶

Finally, in relating the traditions of the first settlement of Mexico by the natives, Sahagun⁷ states:

¹ *Storia antica del Messico*, Ceseno, 1780.

² See Lehmann in *Globus*, vol. 90, 1906, p. 322.

³ Loc. cit., p. 771. From this description one would suppose that Sahagun's "turquoise" included more than one mineral, for turquoises are not transparent.

⁴ Sahagun, loc. cit., p. 772.

⁵ Loc. cit., p. 763.

⁶ In a manuscript copy of Sahagun in Madrid (quoted by Seler, *Gesammelte Abhandlungen zur amerikanischen Sprache- und Alterthumskunde*, Berlin, 1904, vol. 2, p. 637) it is stated that the turquoise was not very hard and that it was first polished with fine sand and then with another polisher. Emery was not utilized as with many other precious stones.

⁷ Quoted by Peñafiel, *Monuments of Ancient Mexican Art*, Berlin, 1890, pp. 26-28.

"The Toltecs also discovered the mine of precious stones, called in Mexico Xivitl (Xihuitl), which means turquoise. This mine, according to the ancients, was in a large hill situated near the village of Tepotzatlan. . . . At present the same name is borne by an inhabited village near Tulla."¹

Use as Attested by Objects

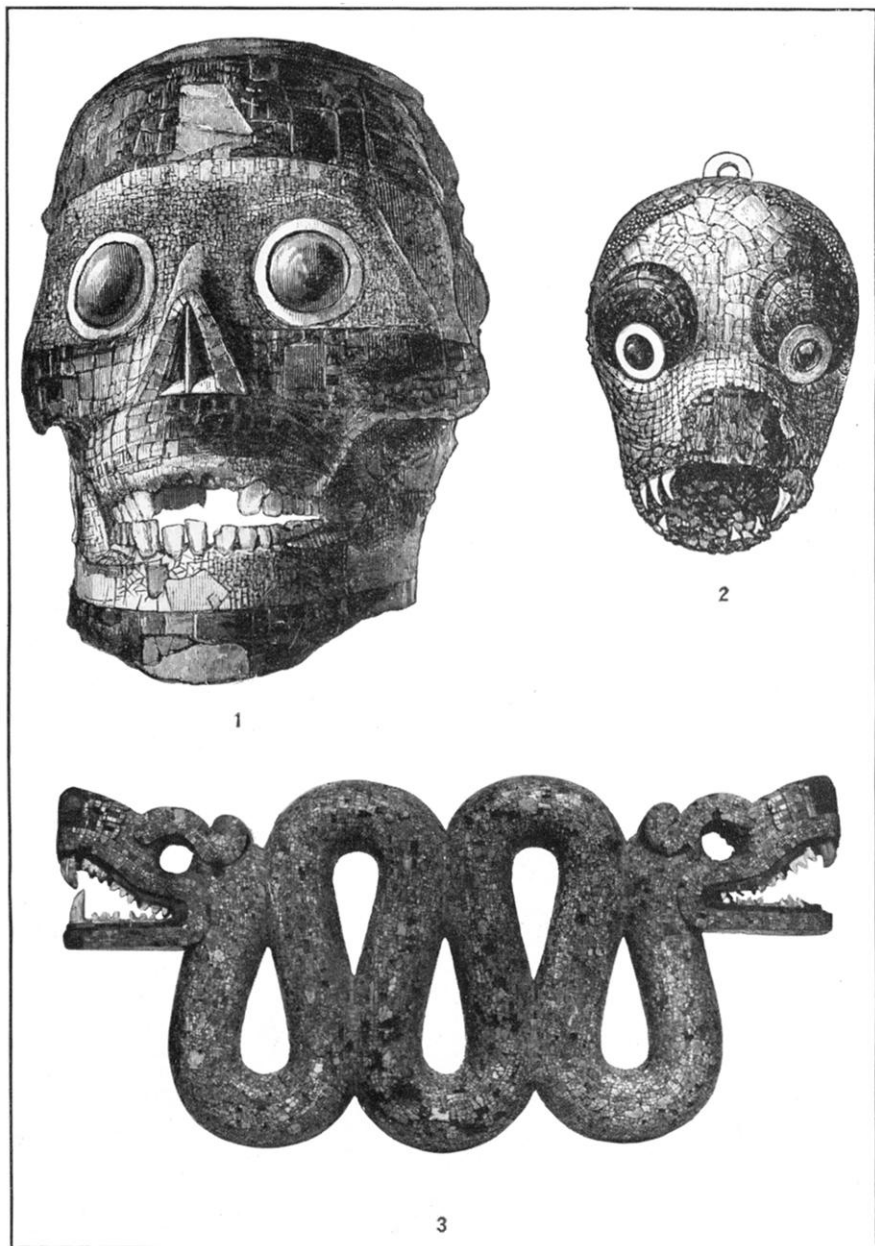
Turquoise has been identified in a number of objects originating within the region of ancient Aztec dominion and coming from farther south in Central America. Its presence substantiates, to an important extent, the historical descriptions of its use as developed in the preceding section, and attests the position it held at the time of the Spanish conquest.

Mosaics.—One of the most interesting and highly developed arts in prehistoric America was that of incrusting objects for ceremonial and ornamental purposes with precious and semi-precious stones.² Ancient mosaics, showing skill in workmanship and taste in design, are to be seen in many of the leading museums. This form of art reached its highest development in ancient Mexico (including Central America), although excellent examples are known from ruins in the southwestern portion of the United States, and objects from Peru inlaid with turquoise³ indicate a similar, though less perfected, application in South America. The materials usually employed were turquoise, jadeite, malachite, quartz, beryl, garnet, obsidian, pyrite, gold, and vari-colored shell, cemented to a base of wood, bone, or stone by means of a tenacious vegetal pitch of local origin. Only twenty-four examples from Mexico and Central America are now known. As a result of a peculiar coincidence of circumstances, twenty-three of these are to be found in European museums, most of this number having reached the continent during Spanish occupancy of the region in question. The best preserved of these objects are very beautiful and are among the highest types of art attained in aboriginal America.

¹ Not far from Mexico City.

² Gomara (*Histoire générale des Indes Occidentales, et Terres Neuues*, trans. into French by Fumée, Paris, 1606, p. 46) refers to the Aztec custom of inlaying figures and masks of wood with various colored stones.

³ Joyce in *American Anthropologist*, vol. 10, 1908, pp. 16-23. Joyce, *South American Archaeology*, London, 1912, p. 206.



ANCIENT MEXICAN INLAID OBJECTS

1. Mask. Human skull inlaid with turquoise and obsidian. British Museum. (After Read.)
2. Pendant. Ape-like head of wood inlaid with mosaic of turquoise and other stones. British Museum. (After Read.)
3. Breast ornament of wood covered with turquoise mosaic. British Museum. (Photo supplied by T. A. Joyce.)

The mosaics are distributed as follows: Nine¹ in the Christy Collection of the British Museum in London; five² in the Prehistoric and Ethnographical Museum in Rome; three³ in the Royal Museum for Ethnology in Berlin; three⁴ in the Imperial Museum in Vienna; two⁵ in the Ethnographical Museum in Copenhagen; one⁶ in the Ducal Museum in Gotha; and one⁷ in the United States National Museum at Washington. These will be described briefly in the order given, followed by a discussion of their origin and significance.

Of the nine specimens in the British Museum, the most interesting and best known is the mask shown in pl. XXIX, 1. It consists of a human skull, the front of which is covered with a mosaic of five transverse bands alternately of turquoise⁸ and highly polished obsidian. The rear portion has been cut away to admit of its being hung, by the leather thongs which still remain, over the face of an idol, as was the custom in Mexico to mask the gods on state

¹ Tylor, *Anahuac: or Mexico and the Mexicans, Ancient and Modern*, London, 1861, app. 5, pp. 337-339. Bourbourg, *Recherches sur les ruines de Palenqué et sur les origines de la civilisation du Mexique*, Paris, 1866. Franks, *Guide to the Christy Collection, British Museum*, 1868. Stevens, *Flint Chips*, London, 1870, pp. 324-328. Brocklehurst, *Mexico Today*, London, 1883, p. 194. Read in *Archæologia, Soc. Antiquaries*, London, vol. 54, 1895, pt. 2, pp. 383-398. Oppel in *Globus*, vol. 70, 1896, pp. 4-13. Lehmann in *Globus*, vol. 90, 1906, pp. 318-322.

² Pigorini, *Gli antichi oggetti messicani incrostatì di mosaico*, Reale Accad. dei Lincei, Rome, 1885. Andree, *Ethnographische Parallelen und Vergleiche*, Leipzig, 1889, pp. 127-130. Read, loc. cit. Oppel, loc. cit. Peñafiel, *Indumentaria Antigua; Vestidos Guerreros y Civiles de los Mexicanos*, Mexico, 1903, pp. 101-103. Bushnell in *American Anthropologist*, vol. 8, 1906, pp. 243-255. Lehmann, loc. cit.

³ Bastian in *Verh. Berliner Gesellsch. Anthropol.*, 1885, p. 201. Uhle in *Congrès intern. Américanistes*, 7me sess., 1888, Berlin, 1890, p. 738. Uhle in *Veröff. Kgl. Museum für Völkerkunde*, Berlin, 1889, pp. 2, 20. Andree, loc. cit. Peñafiel, 1903, loc. cit. Lehmann, 1906, loc. cit. Lehmann in *Congrès intern. Américanistes*, 15th sess., Quebec, 1906, vol. 2, 1907, pp. 339-349.

⁴ Steinhaur, *Handkatalog für die Besuchenden*, Copenhagen, 1880, p. 19; 1886, p. 22. Heger in *Annalen des k. k. Naturhistor. Hofmuseum*, Wien, vol. 7, 1892, pp. 379-400. Lehmann, 1906, loc. cit.

⁵ Duc in *Archives de la commission scientifique du Mexique*, Paris, 1867, vol. 3, pt. 1, pp. 157-158. Anon., *Congrès International d'anthropologie préhistorique*, C.-R. 4me. sess., Copenhagen, 1869, p. 462. Stevens, loc. cit. Andree, loc. cit. Lehmann, 1906, loc. cit.

⁶ Andree, loc. cit. Ibid., *Internat. Arch. für Ethnogr.*, vol. 1, 1888, pp. 214-215. Ibid., *Congrès intern. Américanistes*, 7th sess., 1888, Berlin, 1890, pp. 146-149.

⁷ Blackiston in *American Anthropologist*, vol. 12, 1910, pp. 536-541.

⁸ Read, loc. cit.

occasions.¹ The eyes are disks of shiny pyrite surrounded by circles of white shell; and the nasal cavity has been slightly enlarged, with the insertion of pink shell.² This interesting object was acquired from the Hertz Collection, having previously been obtained about the year 1845 at a sale of a collection in Bruges, suggesting that it was brought from Mexico soon after 1521 and before the expulsion of the Spaniards from Flanders during the revolt of the Low Countries in 1579.³ No. 2 (pl. xxx, 1)⁴ is a mask of cedar wood, formed of two rattlesnake carvings entwined to represent a human face. The front is covered with a mosaic of turquoise, of bright blue and dull green color, so distributed as to give to the two snakes a different shade. The specimen is 6.9 inches high and was purchased in Paris in 1870 from the Demidoff Collection. No. 3 (pl. xxx, 2)⁵ is a mask of cedar cut to fit the face; its surface is covered with a beautiful mosaic of accurately fitted, polished slabs of turquoise, mostly of a brilliant blue. The face is studded with numerous knobs of polished turquoise, and the eyes are mother-of-pearl.⁶ The specimen, which is in an excellent state of preservation, came from a collection in Florence or Venice. No. 4⁷ is a sacrificial knife with blade of yellowish, opalescent chalcedony. The handle is of light-colored wood carved in the form of a crouching human figure, wearing an eagle mask, its face appearing through the widely opened mouth of the bird. The figure is incrustated with a mosaic of turquoise, blended with malachite and white and red shell; much of the mosaic has now disappeared from its setting. This piece was previously in the Hertz Collection, having been acquired in Florence or Venice. No. 5⁸ is a headpiece, or helmet, cut from a single block of wood with the interior hollowed and painted green. It is carved in ornamental shape, pointed at the

¹ Tylor, loc. cit.

² The mask is figured in colors in the publications by Bourbourg and Brocklehurst, previously cited.

³ Tylor, loc. cit.

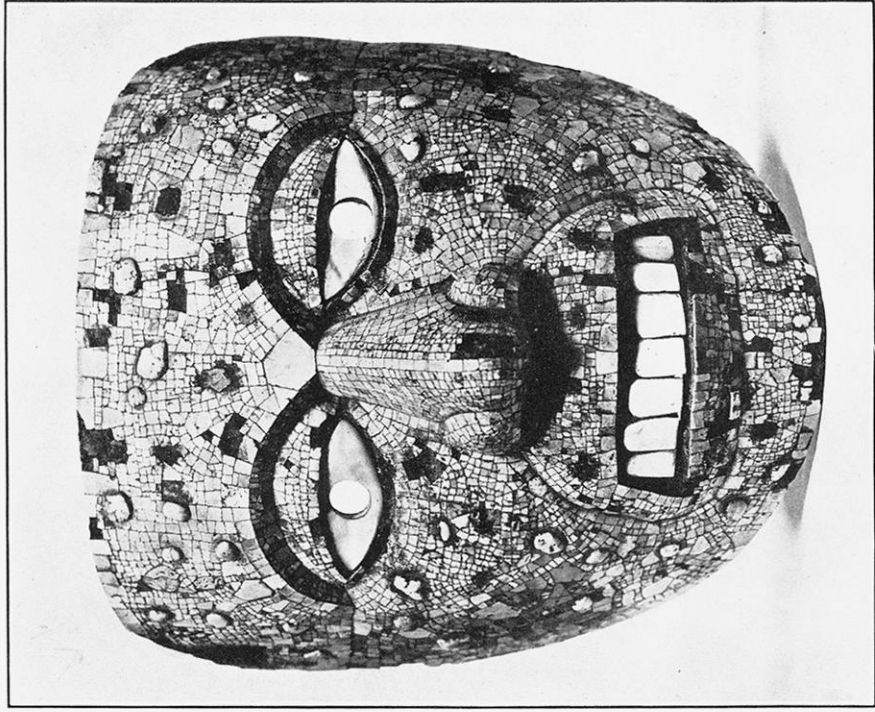
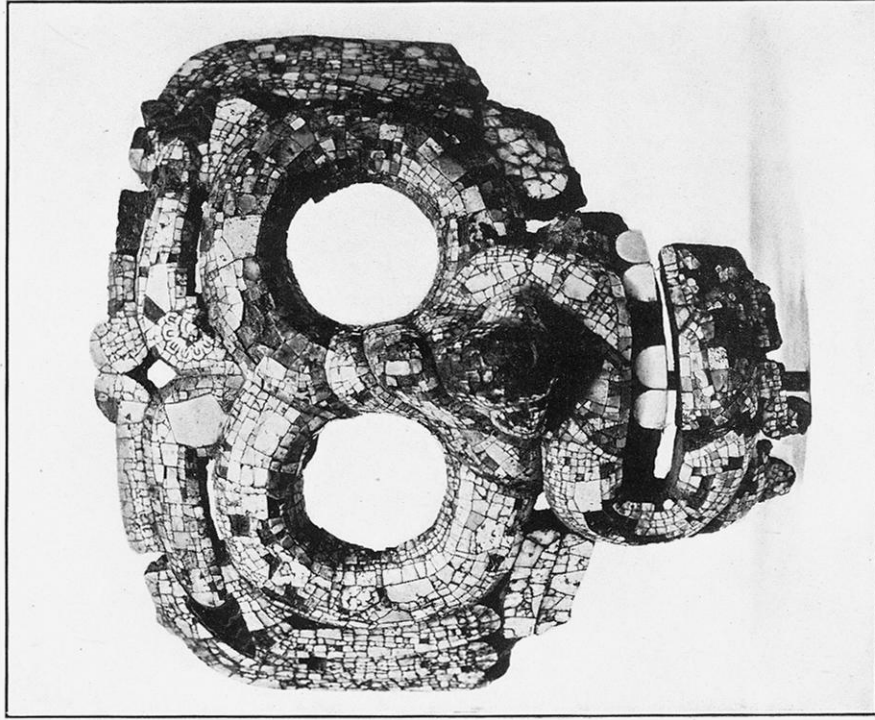
⁴ Read, loc. cit.

⁵ Ibid. Tylor, loc. cit.

⁶ Figured in colors in Bourbourg.

⁷ Tylor, loc. cit. Read, loc. cit.

⁸ Read, loc. cit.



back and front, probably to represent the upper mandible of an eagle, and was covered with a mosaic of turquoise, malachite, pearl shell, and pink shell. Much of the mosaic is gone, but sufficient remains to show an involved design, including two conventional rattlesnakes. Its history may be traced back to 1854, when it was purchased in Paris. No. 6¹ consists of a circular disk or shield of cedar, about 12 inches in diameter, with a mosaic of turquoise and shell in elaborate design, including the snake, human figure, and geometric patterns. This example was purchased in 1866 from a dealer, who stated that it came from Turin. It resembles in design the famous "Reloj de Montezuma" or calendar-stone in Mexico City. No 7² is a pendant of white wood, 4 inches high, carved to represent an ape-like head, with open mouth, as shown in pl. XXIX, 2. The front is covered with a mosaic of turquoise, malachite, and other stones. The turquoise is mostly of a pale green color, but two patches above the sides of the mouth are a bright blue. This specimen was obtained in 1866 from a dealer who had secured it in northern Italy. No. 8³ is a breast-ornament of light-colored wood, fashioned in the form of a two-headed snake with body disposed in meander loops (see pl. XXIX, 3). It is 17.5 inches in length, and is covered on the front with a mosaic of fairly uniform turquoise slabs, with a line of larger pieces following the middle of the body. It was obtained from an old collection in Rome. No 9,⁴ the final example, consists of the figure of a feline animal, with open mouth and protruding tongue, crouching upon its haunches. It is 6.8 inches in height, and was carved from a block of brown wood; its surface shows the remains of a mosaic of turquoise, malachite, pink shell, and pyrite. Its history is not known.

The five incrustated objects in Rome have been described and illustrated in colors by Pigorini,⁵ and a photographic reproduction of them is shown in pl. XXXI of this paper. They include two

¹ Read, loc. cit.

² Read, loc. cit.

³ Read, loc. cit.

⁴ Read, loc. cit.

⁵ Loc. cit.

AM. ANTH., N. S., 14—30.

masks, two knife-handles, and a musical instrument or rattle. Mask No. 1 (pl. xxxi, 3) is made of wood, the back hollowed out to fit a human face, and the outside incrustated with a partly preserved mosaic consisting of malachite, turquoise, red, white, and blackish shell, and pearl shell, besides a little garnet and several squares of pyrite. The eye cavities and half-open mouth are colored red, and out of the latter issue two white tusks and a tongue, which projects to the chin, where it joins an appendage below, resembling the head of an animal. The piece was acquired in 1878 from the University of Bologna; during the 17th century it was in the collection of Aldrovandus.¹ Mask No. 2 (fig. 4) is somewhat similar to that just described, although its back is not hollowed out. It was obtained in Florence in 1880, and its history can be traced by inventories back to the middle of the 16th century, the first mention of it being in the *Inventario della Guardaroba Medicea* (1553-1559). The two knife-handles (figs. 1 and 2) are in the form of crouching figures, the one human, and the other with a human body and an animal's head with widely open mouth. Both are entirely covered with mosaic of turquoise and other minerals, and are somewhat similar to the knife-handle in the Christy Collection in the British Museum. These two pieces are figured in an old catalogue of 1677.² The musical instrument or rattle (fig. 5) is made of a human femur, with the ball covered with mosaic, a few pieces of which still remain. Its history is not known.

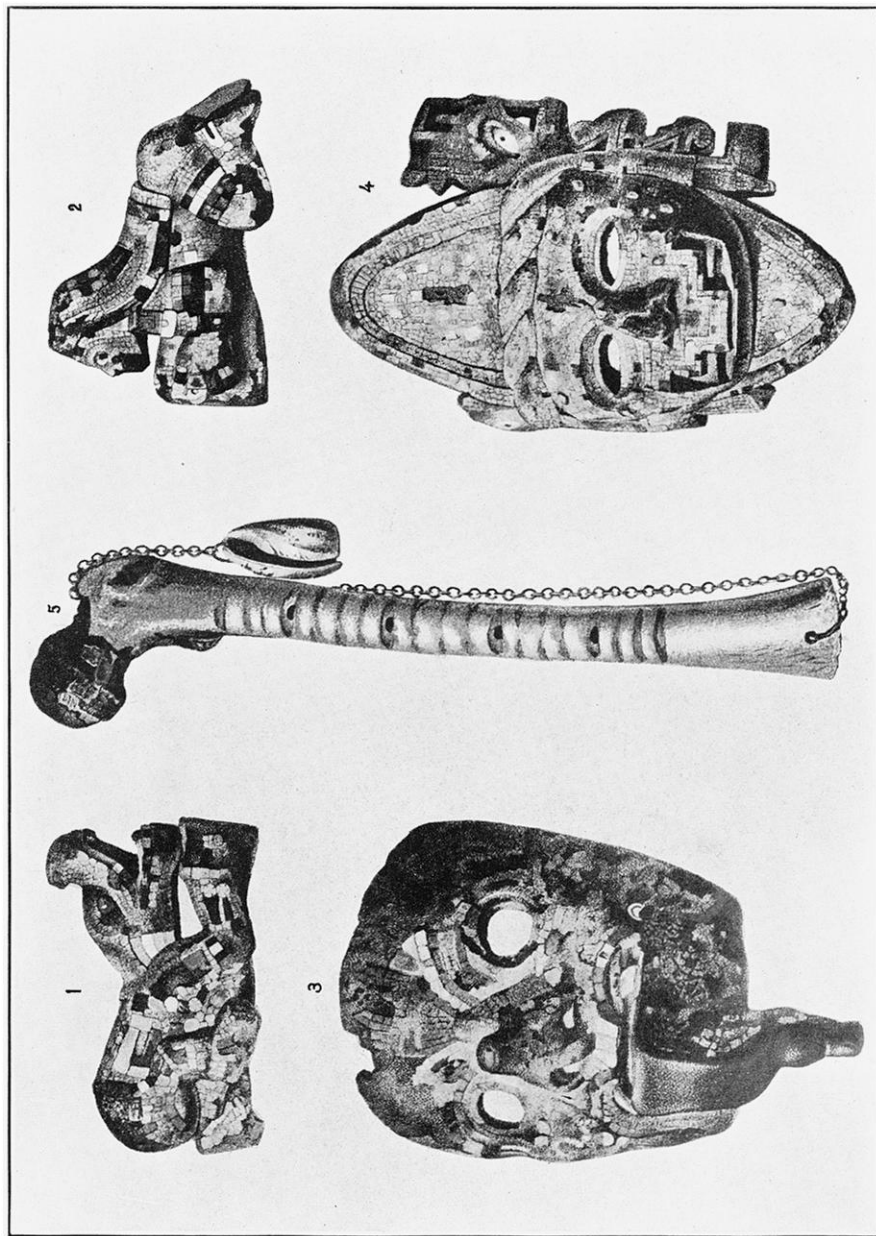
The three ancient mosaics deposited in Berlin include a skull mask and two animal figures. The most interesting of these is the first,³ which is fashioned from a human skull inlaid over the surface with small slabs of sky-blue to pale turquoise. This specimen was previously in the Ducal Museum of Braunschweig. The second piece⁴ is a two-headed jaguar, 12.5 inches long, carved

¹ Aldrovandus, *Musæum Metallicum*, Bologna, 1647, p. 550.

² Legati, *Museo Cospiano*, Bologna, 1677, p. 477. Licetus (*Pyronarcha sive de fulminum natura deque febrium origine libri duo*, Padua, 1634, pp. 123-126) figures and describes two knife-handles similar to those in Rome and the one in London. Lehmann (1906, loc. cit.) thinks that these two represent the ones described by Aldrovandus (1647, loc. cit.) and are now apparently lost.

³ Bastian, loc. cit.

⁴ Lehmann, 1907, loc. cit.



ANCIENT MEXICAN OBJECTS ADORNED WITH MOSAICS OF TURQUOISE AND OTHER STONES. PREHISTORIC AND ETHNOGRAPHICAL MUSEUM IN ROME. (AFTER PIGORINI)

from a piece of wood and covered with plates of turquoise and malachite, with some obsidian, shell, and mother-of-pearl. The eyes are malachite. It came to the museum through the estate of Alexander von Humboldt, who must have secured it during his journey in Mexico, though he left no note concerning its acquisition. The third example is a jaguar head of wood, inlaid with shell, turquoise, and malachite. This specimen was formerly in the Ducal Museum of Braunschweig.

There are three turquoise incrustated objects in Vienna. No. 1¹ is a circular, slightly convex, wooden shield, about 16.5 inches in diameter. Except for a narrow border it was formerly covered with an elaborate design in turquoise mosaic, which has almost entirely fallen away, leaving impressions in the gum indicating its original extent. The object probably formed the center of a shield, somewhat similar to those presented to Cortés by Montezuma. No. 2 represents the head of an animal, carved of light-colored wood and covered with an inlay of pieces of shell, jadeite, turquoise, and glass or obsidian. This is of somewhat different make from the other mosaics, and is executed in a much bolder and rougher style. The earliest mention of these two objects was in an inventory for the year 1596. In 1891 they were encountered by Mrs Zelia Nuttall in the Ambras Collection, and were subsequently transferred to the Imperial Hofmuseum in Vienna. No. 3² is a Xolotl figure. Its history is not known.

The two specimens in Copenhagen are masks of wood, ornamented with mosaics of turquoise, mother-of-pearl, and small shells.³

The single specimen in Gotha is a well-made mask in the shape of a bird's head.⁴ It is decorated with an inlay consisting of malachite, turquoise, mother-of-pearl, red coral, and white shell, but most of the mosaic has fallen out. This object was obtained from a Jesuit collection in Rome about 1800.

The final example forms part of the Blackiston Collection in the United States National Museum, and has an added interest in being

¹ Heger, loc. cit. The turquoise was identified as such by F. Berwerth.

² Lehmann, loc. cit.

³ *Congrès International 1869*, loc. cit. Steinhaur, loc. cit.

⁴ Andree, loc. cit.

the only specimen of ancient Mexican or Central American mosaic art now known on this continent. The object¹ is a life-sized mask which was formerly covered by a mosaic of turquois² and other stones set in a thick layer of gum or pitch. Three greatly elongated projections serve for the nose and two lips. There are two circular openings for the eyes, and smaller ones on the side to carry thongs which bound it to the head. In the forehead is an oval hollow which possibly formed a setting for a large ornamental stone, since fallen out. Along the sides of the face are impressions in the gum of regularly shaped stones, larger than those of the rest of the mosaic. The remainder of the mask was covered by thin, polished slabs of turquois, a number of which are still in place. The turquois is fine blue and green to dirty grayish or yellowish. The mask was recently collected by A. H. Blackiston from a cave in Honduras, near the ruins of the ancient city of Naco.

The twenty-four known mosaics, by way of summary, are as follows:

- | | | |
|---------------------------|---|---|
| 10 masks | { | Human skulls, 2 (London, Berlin). |
| | { | Wood, 7 (2 London, 2 Rome, 2 Copenhagen, 1 Washington). |
| | { | Bird mask, 1 (Gotha). |
| 5 beasts | { | Beast heads, 3 (London, Berlin, Vienna). |
| | { | Beast figures, 2 (London, Berlin). |
| 3 knife handles | | (1 London, 2 Rome). |
| 2 shields | | (London, Vienna). |
| 1 helmet | | (London). |
| 1 double snake | | (London). |
| 1 bone musical instrument | | (Rome). |
| 1 Xolotl figure | | (Vienna). |

Except one mask (Washington) recently collected in Honduras, the other mosaics have been in Europe for a long period. Nearly all of them were acquired by European museums from old continental collections. More than half were at one period in Italy³ (distributed in Florence, Venice, Turin, Bologna, and Rome), the principal owners being the Medici in Florence, Ferdinando Cospi,

¹ Blackiston, loc. cit. The specimen is no. 258271.

² Identification verified by the present writer.

³ Lehmann, 1906, loc. cit.

a relative of the Medici, and Ulysses Aldrovandus in Bologna. As has been noted, some of these (or analogous examples, now lost) were mentioned in old catalogues of the years 1553, 1596, 1643, 1647, and 1677. It is probable that the majority reached Europe during and immediately after the Spanish conquest of Mexico. Most of these are of Aztec origin, though some were probably fashioned by tribes living farther to the south.

According to Lehmann¹ the mosaic art seems to have centered within the country east of the Mexican highland where, he believes, it existed in a specially flourishing condition. The turquois utilized was possibly derived from near-by deposits now unknown. There is some authority² for believing that this mineral was imported from Guatemala and Xochonuchco, and ancient tradition points to the village of Tulla as a source.³ It is almost certain, however, that part of it at least was obtained through trade from the Cerillos locality in New Mexico, which was extensively exploited in pre-Spanish time.

The mosaics were not ordinary ornaments. They had a symbolical meaning and were apparently confined to ceremonial application. They were the insignia of the Aztec gods, and, as such, were employed to adorn their representatives, both idols and priests. They had, moreover, a legendary significance, and tradition frequently attributed their use to the deities. The presents sent by Montezuma to Cortés included objects elaborately adorned in turquois mosaic; these gifts carried a special meaning in that they were the regalia dedicated to the memory of Quetzalcoatl, of whom Cortés was believed to be the reincarnation.⁴

Dental mutilation.—A peculiar custom of aboriginal America, and one most frequently practised in Central America and Mexico, was that of altering the shape of the teeth or modifying their appearance by the insertion of different materials. Several of the

¹ *Globus*, vol. 90, 1906, p. 322.

² Sahagun, book II, edition of H. Siméon, p. 763. Hernandez, *Hist. Animalium et Mineralium Novæ Hispaniæ*, book I, tr. 6, p. 90, cited by Lehmann, 1906, p. 319.

³ See page 444.

⁴ Sahagun, loc. cit., book 12, chap. 4. See also Nuttall, The Atlatl or Spear-thrower, *Peabody Museum Papers*, Cambridge, 1891, vol. I, no. 3, pp. 21-23.

early Spanish historians refer to this fashion, and in the Catalogue of the Bishop Collection of Jade¹ is a reproduction of three teeth incrustated with green jadeite. A mythological personage known as Vukub-Cakix is described as possessing teeth incrustated with blue stones that shone like the face of the sky,² and this appears to refer directly to the use of turquoise for adorning the teeth. That such was actually done is attested by an upper jaw-bone exhumed in 1882 from a sepulcher near Campeche in Yucatan, which bore six teeth inset with convex and polished turquoises of blue-green color.³

THE ANCIENT USE OF TURQUOIS IN THE SOUTHWEST⁴

Use as Attested by Historical Evidence

Vague rumors reached the Spaniards of enormous riches to the north of Mexico, and toward the middle of the sixteenth century we find them turning their attention to this unknown and alluring region. In 1535 Cabeza de Vaca, with three companions, made an extraordinary journey from eastern Texas to Sonora on the Pacific coast,⁵ which subsequently led to the discovery of New Mexico. Cabeza de Vaca was the first to note the use of turquoise among the sedentary tribes. When near the Pacific coast he was made presents of turquoise by the Indians. Among the Sierra Madre, about 90 miles east of the Yaqui river in Sonora, he found the Indians owning turquoises, and, inquiring whence they came, was informed that they were brought from the distant north where they were obtained in exchange for parrot plumes.⁶

In 1539 Fray Marcos de Niza, with a negro companion named Estevan, penetrated northward into the present New Mexico in

¹ *Investigations and Studies in Jade*, New York, 1906, vol. 2, p. 101.

² Bourbourg, *Popol-Vuh*, Paris, 1861, quoted by Boman, *Antiquités de la région Andine*, etc., Paris, 1902, vol. I, p. 583.

³ Hamy in *Bull. Soc. d'Anthr. de Paris*, vol. 5, 1882, p. 884, figured. This object is also described by the same writer in *Décades américanæ*, *Mem. d'arch. et d'ethn. américaines*, déc. III, no. 28, p. 92.

⁴ This term is used to include the plateau region now comprising Arizona and New Mexico, and adjacent parts of Mexico, California, Nevada, and Colorado.

⁵ Bandelier, *Contributions to the History of the Southwestern Portion of the United States*, Cambridge, Mass., 1890.

⁶ *Ibid.*, pp. 42, 61.

search of the "Seven Cities of Cibola".¹ While his account of the adventuresome journey is exaggerated as to detail, it is in the main reliable. He found the natives of the region valuing turquois as ornaments and using it for exchange. He was impressed by the great number of turquoises worn by the Sobaipuris of the Rio San Pedro in southern Arizona, the last region inhabited by village Indians before Zuñi was reached.² The natives along his course gave Fray Marcos presents of turquois and ox-hides.³ Nearing Cibola he reached a village on the edge of the desert, where the inhabitants wore turquoises suspended from the ears and nostrils; these ornaments were called *cacona* and the wearing of them *casconados*.⁴ Many turquoises were offered the friar, who was told that these gems abounded in Cibola as well as in the kingdoms of Marata, Acus, and Tontontecac.⁵ Estevan, who had shown undue zeal in collecting turquoises,⁶ had been sent ahead to Cibola, where he became involved in difficulties with the Indians and was killed. Niza followed and found that the people of Cibola "have emeralds and other jewels, although they esteem none so much as turqueses wherewith they adorn the walls of the porches of their houses, and their apparel and vessels; and they use them instead of money through all the country."⁷ Niza took formal possession of Cibola and returned to Mexico, where he gave a glowing account of the riches of the new country. A force was then raised under Coronado and dispatched to conquer Cibola.

In 1540 Coronado visited the newly discovered country of Cibola, and reported that Niza had enlarged upon the richness of the place and denied that the houses were decorated with tur-

¹ A group of pueblos, now in ruins, centering about the present pueblo of Zuñi.

² Bandelier, *Contributions to the History of the Southwestern United States*, Cambridge, 1890, p. 442.

³ Extracts from journal of Fray Marcos de Niza, published in the Indian Report by Lieut. Whipple, *Pacific R. R. Expl. and Surv.*, vol. 3, pt. 3, 1856, pp. 105-108.

⁴ Davis, *Spanish Conquest of New Mexico*, 1869, p. 125.

⁵ *Ibid.*, p. 125. Marata has been identified as the ruined Makyata near Zuñi; Acus as the pueblo of Acoma; and Tontontecac as the Tusayan or Hopi province, north-westward from Zuñi. See Winship, *The Coronado Expedition, 14th Ann. Rep. Bur. Amer. Ethnol.*, 1892-93, pt. 1, p. 357.

⁶ Winship, *loc. cit.*, p. 357.

⁷ Marcos de Niza in Whipple's *Report*, 1856, *loc. cit.*

quoises.¹ However, he noted that the natives possessed turquoises of good quality, as well as "turquoise earrings, combs and tablets set with turquoises";² and he further observed that they sometimes offer turquoises in their worship, which is principally of water.³ When Coronado had occupied Cibola he heard of Tusayan (the present Hopi pueblos) and dispatched Don Pedro de Tobar to capture its villages. After a brief fight, in which the natives were defeated, the latter sued for peace, offering gifts including turquoises.⁴ Somewhat later Alvarado was dispatched by Coronado on a short journey past Acoma to Cicuye (the present Pecos), where he was presented with cloth and turquoises, "of which," he reported, "there are quantities in that region."⁵

In a letter⁶ from Mendoza to the King of Spain, written in 1540, it is observed that the people of Cibola have turquoises in quantity, though not so many as Marcos de Niza at first affirmed. Castañeda,⁷ who accompanied Coronado to Cibola, referred to the custom in Culiacan (Sinaloa) of making presents of turquoises to the devil and of decorating certain classes of women with bracelets of fine turquoises. According to Bandelier⁸ the Seri of Sonora, in early Spanish time, exchanged iridescent shells from the Gulf of California for the turquoise of Zuñi; and the Opatá gave parrot skins and plumes to the people of Zuñi in return for turquoise and turquoise ornaments. The Apache between the years 1630 and 1680 were accustomed to come to the pueblo of Pecos to trade in

¹ Coronado, Extracts from journal, published by Lieut. Whipple in *Pacific R. R. Expl. and Surv.*, vol. 3, pt. 3, 1856, pp. 108-111. According to F. H. Cushing the custom of adorning the porches of the houses with turquoises is supported by tradition.

² *Ibid.*

³ Winship in *14th Ann. Rep. Bur. Amer. Ethnol.*, 1892-93, p. 573. In Smith's *Relación de la Jornada de Coronado á Cibola* (Colección de Documentos para la Historia de Florida, London, 1857, vol. 1, p. 148) it is stated that the people of Cibola offered turquoises of poor quality in sacrifice to their springs. This custom of devoting offerings to the sources of water was widespread among the Pueblo Indians. See Hough, *Sacred Springs of the Southwest*, *Rec. of the Past*, vol. 5, 1905, pp. 163-169.

⁴ Castañeda's narrative in Winship, loc. cit., p. 489.

⁵ *Ibid.*, p. 491.

⁶ Translated in Winship, loc. cit.; see p. 549.

⁷ Narrative, in Winship, loc. cit.; see p. 513.

⁸ Bandelier, *Final Report of Investigations among the Indians of the Southwestern United States*, Cambridge, 1891, pt. 1, p. 39; also p. 63.

turquois.¹ The Yaqui in former times held the turquoise in place of money.² The Tano during the 16th century owned the Cerillos turquoise deposits in New Mexico and guarded them jealously,³ and the turquoise obtained therefrom proved quite an important resource for purposes of commerce.

There is little evidence that turquoise was used in Spanish times by tribes living to the north and east of the Pueblo region. It is stated in one place,⁴ however, that in the region of the lower Mississippi the Spaniards saw shawls of cotton, brought, it was said, from the west, and probably from the Pueblo country, as they were accompanied by objects which from their description may have been of turquoise. More than one hundred minute discoidal beads and a small pendant of turquoise, believed to have been derived through trade with the Pueblos, were found with the skeleton of a child in a mound in Coahoma county, Mississippi.⁵

Use as Attested by Objects

Throughout the Southwest turquoise ornaments of various kinds have been found in comparative abundance in graves and ruins. Bandelier⁶ noted turquoises which came from the ruins of Casas Grandes, in Chihuahua, Mexico. Kunz⁷ describes and figures two objects found by F. H. Cushing near Tempe, Maricopa county, Arizona. The first of these is a prairie-dog carved from white marble, with turquoise eyes; the second, a sea-shell incrustated with mosaic of turquoises and garnets (?), fashioned to represent a frog.⁸

¹ Vetancurt, *Teatro Mexicano*, Mexico, repr. 1870-71, vol. 3, p. 323.

² Bancroft, *Native Races of the Pacific States of North America*, New York, 1874, vol. 1, p. 583.

³ Bandelier, *Final Report*, etc., loc. cit., 1890, pt. 1, p. 163.

⁴ Holmes, *Prehistoric Textile Art of Eastern United States*, 13th Ann. Rep. Bur. Amer. Ethnol., 1891-92, p. 25.

⁵ Peabody, *Exploration of Mounds, Coahoma County, Mississippi*, *Peabody Museum Papers*, Cambridge, 1904, vol. III, no. 2, pp. 50-51.

⁶ *Final Report of Investigations among the Indians of the Southwestern United States*, Cambridge, 1890, pt. 1, pp. 39, 352.

⁷ *Gems and Precious Stones*, New York, 1890, p. 61.

⁸ The incrustated frog referred to by Kunz was not found, but was a model of one in possession of Mr Lincoln Fowler, of Phoenix, Arizona, the source of which was one of the ruins in the Salt River valley.—*Editor*.

Blake has referred to a mosaic of turquoise dug from the ruins near Casa Grande on the Gila river,¹ and an ancient cross of clam-shell bordered with turquoise mosaic from a cliff-dwelling on Oak creek,² near Jerome, Arizona. In the latter locality Fewkes³ found some beads in the Honanki cliff ruin, near Oak creek. According to Blake,⁴ also, the ruins of the Salt River valley in Arizona have yielded many turquoise beads and pendants, formerly used for necklaces, and a marine shell incrustated with turquoise.

In 1896 some interesting finds of turquoise objects were made by Fewkes⁵ in the ancient pueblo ruins near Winslow, Arizona. The most important of these is a beautiful ornament of shell incrustated with turquoise,⁶ found at Chaves Pass, on the breast of a skeleton. It consists of one valve of *Pectunculus giganteus*, coated with gum, in which are inlaid rows of green turquoise slabs carefully fitted together, the object representing a frog or a toad. The near-by ruins along Cheylon creek, a tributary to the Little Colorado, likewise furnished turquoise ornaments, including a square fragment of lignite, inlaid with five small turquoises; a pear-shaped pendant of bone covered on one surface with turquoise mosaic; an armlet of shell inlaid with turquoise; and an object of shell and turquoise combined in an incrustation on wood. Of the dress of the ancient Patki people who formerly inhabited these ruins, Fewkes⁷ says:

"For ornaments they wore shell, bone and turquoise variously worked. The most elaborate forms of these ornaments were shell and turquoise incrustations on wood, shell, lignite or bone. . . . The women had ear-pendants made of rectangular fragments of lignite set with turquoise, bone incrustated with the same, or simple turquoise. Both sexes had armlets, wristlets and finger rings made of the marine shell *Pectunculus giganteus*, sometimes inlaid with stone."

From the Black Falls ruins, on the Little Colorado, about 35

¹ *Amer. Jour. Sci.*, vol. 25, 1883, pp. 197-200.

² *Amer. Antiquarian*, vol. 22, 1900, pp. 108-110.

³ *17th Ann. Rep. Bur. Amer. Ethnol.*, 1895-96, p. 573.

⁴ *Amer. Antiquarian*, vol. 21, 1899, pp. 278-284.

⁵ *Ann. Rep. Smithsonian Inst.*, 1896, pp. 517-539.

⁶ Figured in colors in the publication cited, p. 529. Also described in *American Anthropologist*, vol. 9, 1896, pp. 359-367.

⁷ *Loc. cit.*, p. 534.

miles northeast of Flagstaff, Fewkes obtained an interesting pair of ear-pendants, made of lignite slabs, upon which are cemented small squares of turquoise and lignite, arranged in simple though attractive geometrical design, with a slab of yellow indurated clay in the center.

Farther north, in the Sikyatki ruin in the Tusayan province, many turquoise objects have been unearthed¹ during the course of archeological excavations. The ancient Sikyatki people buried their dead with the ornaments worn while living, and their skeletons were frequently found with rows of turquoise beads about their necks and single pendants near the mastoid process, indicating that the bodies had been decorated with necklaces and pendants. A food vessel collected from the Sikyatki ruin is decorated with the painted head of a woman wearing square ear-pendants of turquoise mosaic, similar to those worn by the Hopi women of today. A pair of similar earrings consisting of flat slabs of wood, with one side covered with tiny squares of turquoise set in hardened pitch, has been found by Cummings² in the Betatakin ruin, a well-known cliff-dwelling near Marsh Pass in northwestern Arizona.

Turquoise beads and ear-pendants are frequent in the ruins of northwestern New Mexico and the adjacent region.³ In 1899, George H. Pepper found many turquoise carvings and some imperfect mosaics in ruins in the Mancos cañon,⁴ in the southeastern corner of Colorado. Of special interest were tadpoles from $\frac{1}{4}$ to 1 inch in length, fashioned of turquoise and perforated for suspension as pendants; and frogs nearly 3 inches long made of black jet, with raised eyes of turquoise and a band of the same material back of the eyes. The turquoise was mostly of a rich green, though some pieces were partly bluish. Dr J. Walter Fewkes⁵ has seen a beautiful bird mosaic, inlaid with turquoise, from one of the ruins near Cortez in the Montezuma valley, not far from Mancos. This object is made of hematite, with turquoise eyes and neckband. The

¹ Fewkes in *17th Ann. Rep. Bur. Amer. Ethnol.*, 1895-6, pp. 641, 662, 733.

² *Bull. Univ. Utah*, 1911, vol. 3, no. 3, pt. 2, p. 35.

³ Bandelier, *Final Report*, loc. cit., p. 352.

⁴ Kunz in *21st Ann. Rep. U. S. Geol. Surv.*, 1899-1900, p. 456.

⁵ *Bur. Amer. Ethnol., Bull. 41*, 1909, p. 27.

feathers are represented by stripes of inlaid turquoise, and upon the back is an hour-glass figure, also in turquoise inlay, recalling designs in ancient pottery. A single specimen of turquoise, probably an ear-pendant, was found in the Cliff Palace ruin in the same region.

The most important series of turquoise objects yet found in this country, however, was the result of explorations made in 1896 by George H. Pepper¹ in the ancient Pueblo Bonito of Chaco cañon, northwestern New Mexico. Mosaics, carvings, beads, and pendants in great quantity and variety were found in the burial rooms and accompanying the skeletons of the former inhabitants. A few may be described. One of the objects is a "bone scraper" formed of the humerus of a deer or an elk and decorated about its center with an inlay of jet and turquoise, showing considerable taste and skill in execution and design. Another is a head or breast ornament, made of polished jet, its four corners set with circular turquoises. Another jet object is designed to represent a frog or a toad; its body is carefully rounded and polished; the eyes are two large rounded pieces of turquoise standing boldly out, and across the neck is a broad inlaid band of the same material.² A suite of eight duck-like birds, carved from decomposed turquoise, of pale bluish-green color, were prominent among the finds. The figures were probably roughed-out with a stone implement and then ground to the desired shape with sandstone grinders. In addition, the ruins yielded a quantity of turquoise pendants and discoidal beads, mostly green in color; one pendant, however, showed a delicate blue.

One burial room in particular has served as the subject of a special paper by Mr Pepper,³ and the number and variety of turquoise ornaments found therein is remarkable. About the neck, breast, waist, wrist, and ankles of several of the skeletons, turquoise beads to the number of several thousand were encountered, together with pendants and carved pieces. Near one of the bodies

¹ *American Anthropologist*, vol. 7, 1905, pp. 183-187.

² Among the Pueblo Indians of today, as well as among the ancient inhabitants of the Southwest, the frog is a symbol of water, and its conventionalized design is common in both the ancient and the modern art.

³ The Exploration of a Burial-room in Pueblo Bonito, New Mexico, *Putnam Ann. Vol.*, New York, 1909, pp. 196-252.

was a "turquoise jewel-basket" of cylindrical shape, 3 inches in diameter and 6 inches long, consisting of slender splints, over which a mosaic of turquoise slabs had been cemented by means of piñon gum. The basketwork had decayed, but the mosaic was held in place by the sand in which the object was buried. One thousand two hundred and fourteen pieces of turquoise had formed the mosaic, and within and near the mouth of the cylinder were found 2150 disk-shaped turquoise beads and 152 small and 22 large turquoise pendants, some carved to represent birds. Among thousands of other objects of turquoise there may be noted the following: A stone ornament with inlay of turquoise; another object made of turquoise and shell mosaic inserted on basketwork, the beads being strung and placed on edge in parallel rows; a pendant with turquoise front and trachyte back, showing splendid workmanship; several beads with holes smaller than an ordinary pin; a number of tadpoles, frogs, and buttons of carved turquoise, drilled on the underside for suspension; a pear-shaped ornament made of three turquoise pieces joined with great exactness; a cylinder of hematite ornamented with turquoise inlay, representing a bird; a mouthpiece for a shell trumpet incrustated with turquoise; pendants of various shapes and sizes; beads, ornaments, and inlays in great variety.

Pepper¹ states that this burial chamber probably contained the remains of priests, caciques, or other important personages, and that the objects show a high degree of skill and taste, and "afford conclusive evidence that the people of Pueblo Bonito reached as high a degree of proficiency in the arts as those of any other pueblo in the Southwest."

RECENT AND PRESENT USE OF TURQUOIS IN THE SOUTHWEST

The turquoise is today in wide use among the Indians of the Southwest, and it forms one of their most cherished possessions. As in the past, it still finds a ceremonial as well as an ornamental application.

Pueblo-dwelling tribes.—The Pueblo Indians find great pleasure in turquoise and seldom is a well-to-do representative seen without

¹ Ibid., pp. 251-252.

ornaments of this material. Especially upon gala occasions and during ceremonies is this stone in evidence, and both sexes bedizen themselves with quantities of it. The turquoise is most commonly fashioned into discoidal and cylindrical beads and into various sized pendants of oblong, triangular, and keystone outline. The work is performed by rubbing the material on sandstone and polishing on finer material, and the objects are perforated with a bow-drill, usually tipped with a fragment of quartz or of flint. The workmanship is rather crude, and the finished piece is seldom symmetrical or highly polished. The beads are strung usually on a cord, but sometimes on wire, and one or more strands are used for necklaces, bracelets, and more rarely as ear-ornaments. Discoidal beads are the most common (see pl. xxxii, 3); at times these alternate with cylindrical shapes, and pendants may be inserted, especially toward the center, to give variety. Beads of coral and white shell are often combined with the turquoise, although their introduction lessens the value of the string. Pendants are frequently worn alone, suspended from the ears; indeed, this is perhaps the most common ornament seen in the Southwest. A number of pendants of Sia workmanship shown in pl. xxxii, 6, illustrate the customary shape and appearance of these objects. Finger-rings are sometimes set with turquoise, and the mineral is frequently used for purpose of currency. Furthermore, the turquoise is employed, though not so universally, for inlaying ornaments and objects of utility, and in some instances small slabs of this material are fashioned into mosaics of beauty, though not equal to the superb examples made of old by the Aztecs.

In addition the turquoise finds application by virtue of its supposed efficacy, and consequently it is prominent in many charms, amulets, and fetiches. Few religious rites take place without its use, and the paraphernalia of the priesthood abounds in objects adorned with it. Indeed turquoise may be said to hold a fundamental place in the religious ideas of the Pueblo Indians and in their outward ceremonial expression of them.

The turquoise utilized varies from very inferior material to really beautiful stones. The majority, however, are of little value as



INDIAN TURQUOIS ORNAMENTS

1. Zuñi ear pendants in turquoise mosaic. 2. Hopi ear pendants in turquoise mosaic. 3. Pueblo necklace—turquoise, coral, and shell beads. 4. Zuñi ornament—shell inlaid with turquoise. 5. Navaho ring of silver set with carved turquoise. 6. Pendants of turquoise, Sia workmanship. All of these objects are in the United States National Museum.

gem material, according to our standards. Turquoise matrix is used along with pure material, although the latter is preferred. The Indian is usually a rather keen judge of quality, although he does not so strongly favor the blue color, to the exclusion of the green, as does the white man.

The Zuñi value the turquoise more highly than does any other Pueblo tribe, with the possible exception of the Hopi. A single string of beads of good quality is said to be worth several horses. In former times the Zuñi necklaces were more carefully made than they are today, and numbers of them, worn only on ceremonial occasions, have been handed down from father to elder son for several generations.¹ Two red shells inlaid with turquoise and worn pendent to the necklaces during certain religious rites were in possession of the Zuñi from early time; recently Mrs M. C. Stevenson succeeded in obtaining one of them for the United States National Museum. (See pl. XXXII, 4.) According to Mrs Stevenson, double loops of turquoise beads are worn by the Zuñi in the ears only on ceremonial occasions; at other times they are worn pendent to necklaces. Beautiful mosaics consisting of thin pieces of turquoise cemented to wooden slabs are sometimes suspended from the ears. A good example, with a piece of abalone shell in the center, is shown in pl. XXXII, 1. In the United States National Museum is a Zuñi cradle with a small turquoise inset in a position that would come beneath the heart of the occupant. Many Zuñi fetiches, particularly such as were supposed to be efficacious in the chase, have pieces of turquoise attached to them.² Some are fashioned of stone in crude animal shapes, with inlaid eyes of turquoise. An example of particular interest in the United States National Museum is made of sandstone, dipped in blood, and not only are its eyes of turquoise, but several irregular slabs of this material are inset at intervals over the body.

The most characteristic adornments of the Hopi are the mosaic ear-pendants worn by the women. These are very beautiful, and are made of thin slabs of turquoise, nicely polished and cemented

¹ Stevenson, M. C., *Dress and Adornment of the Pueblo Indians*. Consulted in manuscript.

² Examples are displayed in the United States National Museum.

with piñon gum to a flat wooden base. An example is shown in pl. xxxii, 2. According to Fewkes,¹ the older mosaics of this description are much finer than the modern ones, some of which are made of reworked turquois, containing pieces previously perforated and used for beads. They have generally dropped out of use on the East Mesa of the Hopi domain, where they are preserved as heirlooms.² Necklaces, ear-pendants, bracelets, etc., are used in abundance by the Hopi. The men wear loop earrings similar to those worn by the Zuñi on ceremonial occasions. According to Mrs Stevenson³ the Hopi in 1882 possessed several shell mosaics similar to one illustrated in pl. xxxii, 4. The Hopi have perhaps the most elaborate ceremonies of any Indian tribe, and the turquois figures in many of them. During the famous Snake Dance, each Antelope Priest is customarily adorned with shell and turquois necklaces.⁴ The Walpi Warrior Society, in certain of its rituals, uses a jet snake with turquois eyes and other emblems adorned with turquois.⁵ In several of the Hopi Katchinas, as described by Fewkes,⁶ the figures are represented with ornaments of turquois, and many Hopi fetiches are frequently decorated with this material.

The Keres of Santo Domingo pueblo, New Mexico, wear beads of turquois strung on silver wire, and earrings of the same material.⁷ Their medicine-men, in their ceremonies to induce rain, use a fetich of gypsum in the form of a prairie-dog, with eyes of turquois.⁸ Kunz⁹ mentions a large, flat, drilled turquois amulet that was employed as a charm by these Indians. Roughly ground, heart-shaped ornaments, drilled with a bow-drill with point of quartz or agate, have been sold to some extent by them.¹⁰

¹ 22d Ann. Rep. Bur. Amer. Ethnol., 1900-01, p. 86.

² Fewkes in *American Anthropologist*, vol. 9, 1896, pp. 359-367.

³ *Dress and Adornment of the Pueblo Indians*, op. cit.

⁴ Fewkes in 16th Ann. Rep. Bur. Amer. Ethnol., 1894-95, p. 282.

⁵ Personal communication from Dr Fewkes.

⁶ 21st Ann. Rep. Bur. Amer. Ethnol., 1899-1900, pp. 67, 86, 113, 119.

⁷ Kunz in *Mem. Intern. Congr. Anthr.*, Chicago, 1894, pp. 267-281.

⁸ In the United States National Museum there is a somewhat similar fetich from Sia, New Mexico, with body of gypsum and eyes of turquois, made probably to represent a bear.

⁹ Kunz in *Mem. Intern. Congr. Anthr.*, op. cit.

¹⁰ Kunz, *Min. Resources of the United States for 1883-84*, U. S. Geol. Survey, pp. 767-768.

Pima.—Among these Indians turquoise is now rarely seen, though in the earlier days ornaments of this material were common.¹ Both sexes, but especially the men, wore strands of beads and pendants, usually of turquoise and shell, suspended from the ear-lobes and the neck, while upon the arms of women and the right arms of men were often seen bracelets of similar material. A very brave man was accustomed to pierce the septum of his nose and wear suspended from it a bit of polished bone or else a piece of turquoise or shell.

Navaho.—The wandering Navaho hold the turquoise in no less esteem than do the neighboring pueblo-dwelling tribes, from whom they doubtless derived their fondness for this gem. Indeed they value their turquoise ornaments above all other possessions, and their regard for this precious stone causes them to go to almost any extreme to obtain it. They are inordinately fond of personal adornment, and not uncommonly a single Indian will bedeck himself on special occasions with regalia to the value of several hundred dollars. In general, a man's position and wealth may be judged from the number of ornaments he wears.

A Navaho is seldom seen without ear-pendants and necklaces of turquoise. The former are usually large pieces, roughly fashioned into keystone shape and polished, which are attached to the ears with cord; the necklaces consist of small, perforated, discoidal beads, from one-eighth inch in diameter upward, strung frequently for sake of variety with a few cylindrical beads and pendants or combined with beads of red coral and white shell. Occasionally a saddle-horn or a gun-handle will be studded with small knobs of turquoise. The Navaho also are clever silversmiths, and the turquoise is their favorite stone for setting in various objects of jewelry. Bracelets, buttons, buckles, belts, rings (see pl. XXXII, 5), plaques, and other ornaments are fashioned from Mexican pesos and

¹ Russell in *26th Ann. Rep. Bur. Amer. Ethnol.*, 1904-05, p. 112. An old military report of 1848 (Emory, *Notes of a Military Reconnaissance from Fort Leavenworth, in Missouri, to San Diego, in California*, Senate Ex. doc. 7, 30th Congress, 1st sess., 1848, p. 88) mentions that at that time the Pima and Maricopa Indians were accustomed to resort to near-by ruins after rains to search for trinkets of shell and a "peculiar green stone" (the turquoise).

American silver pieces, and frequently inlaid with roughly polished pieces of turquoise. According to Mrs Stevenson,¹ the first setting of turquoise in silver was done in 1880, after which the Navaho became much interested in this type of work. The Zuñi soon followed their example, and both tribes have produced interesting specimens, although the Navaho excel the Zuñi in originality of design.²

The turquoise passes as currency with the Navaho. He will pay a high price for a desirable stone, and although he has no definite idea of its exact value, he cannot be imposed on with a poor, inferior stone. A Navaho herder was seen on one occasion to buy \$125 worth of turquoises at a trading-store after disposing of about \$300 worth of wool to the trader.³ Much of the turquoise in use is of various shades of green, but occasionally a fine blue stone is seen, and this is particularly valued by the Indian. In rare instances a small turquoise of good color is obtained from one of the cliff-ruins in which the region abounds, and upon such a specimen the Navaho places a particularly high value, refusing to sell it under any circumstances, for he realizes that its color has been tested by centuries and will not fade.

In addition to its ornamental use, the turquoise figures in many Navaho rituals and possesses a religious significance. It is used in the Mountain Chant⁴ and the Night Chant,⁵ two of the most important Navaho ceremonies. Certain sacred objects of ceremonial application are customarily painted blue with powdered turquoise.⁶ The mineral is commonly called *chalchihuilit* and pronounced chal'-chi-we-te by the Navaho.⁷

Other tribes.—The Apache values the turquoise and calls it

¹ *Dress and Adornment of the Pueblo Indians*, op. cit.

² *Ibid.*

³ Sterrett, *Min. Resources for 1911*, U. S. Geological Survey.

⁴ Matthews in *5th Ann. Rep. Bur. Ethnol.*, 1883-84.

⁵ Matthews in *Mem. Amer. Mus. Nat. Hist.*, Hyde Expedition, 1902.

⁶ Matthews, *The Mountain Chant*, in *5th Ann. Rep. Bur. Ethnol.*, 1883-84, p. 421.

⁷ Blake in *Amer. Jour. Sci.*, vol. 25, 1858, p. 227. Also according to personal communications of Mr F. W. Hodge and Dr Walter Hough, who inform me that this Mexican term is commonly employed to designate the stone by the Southwestern Indians. It was the writer's experience that the turquoise was also termed "*doklisi*" by the Navaho. The Zuñi name is '*hli'akwa*'.

duklij ("blue, or green, stone," these two colors not being differentiated in their language). The Apache medicine-man is almost invariably provided with some of this mineral, which is supposed to have unusual virtues. It has long been in use in this manner, for according to Bourke,¹ "it was the Apache medicine-man's badge of office, his medical diploma, so to speak, and without it he could not in olden times exercise his medical functions."

The Ute are stated to prize the turquoise as highly as do the Navaho.² Their congeners, the Paiute, use the turquoise in much the same manner as do the Navaho, but care less for it.

DISCUSSION OF THE USE OF TURQUOIS

The portion of North America wherein the turquoise has found application among the aborigines is sharply limited on the one hand by the Isthmus of Panama, and on the other by a line drawn eastwardly from the Pacific coast through southern Nevada and Colorado, thence southward through Texas to the Gulf of Mexico. This is, of course, due to the fact that the American deposits of turquoise, except two of little importance,³ are confined to this area. Rarely, however, has the dependence of use upon occurrence been so well exemplified. It indicates, too, the lack of communication between the pueblo-dwelling tribes of the Southwest and the other Indians of the United States.

The aboriginal use of turquoise can be further analyzed as due to three principal reasons. Firstly, the mineral occurs upon and near the surface, so that deposits thereof are easily located and readily worked with crude appliances. Secondly, turquoise is comparatively soft and lends itself to primitive methods of shaping, that would make no impress upon the harder stones. And thirdly, the color of the turquoise, ranging from the blue of the sky to the green of water and plants, seems to make a strong psychological

¹ The Medicine-men of the Apache, *9th Ann. Rep. Bur. Amer. Ethnol.*, 1887-88, pp. 588-591. It should be mentioned that Bourke calls the *duklij* malachite, but his description and allusions leave no doubt that turquoise was meant.

² Pepper, 1909, loc. cit.

³ In Alabama and Virginia.

appeal to uncivilized peoples, peculiarly fitting their religious ideas and constantly suggesting a symbolical application.¹

The individual sources of both the ancient and the modern turquois are numerous. Most of them are now known to the whites, although it is believed that certain tribes still obtain stones from localities known only to themselves. The present-day Indians, however, carry on little systematic mining for turquois, obtaining their material through barter with other Indians or by purchase from white traders. They utilize also quantities of turquoises handed down from their fathers. It is a striking circumstance that in America there are no turquois deposits of importance that do not exhibit signs of prehistoric exploitation. At Los Cerillos, New Mexico, in particular, are immense excavations dating from pre-Spanish times. The source of the turquois used by the ancient Indians of the Southwest is therefore apparent. To trace the source of the turquois used in Mexico and Central America is more difficult. No occurrence at all adequate as an important source has been discovered south of the present Mexican boundary. It therefore seems probable that the Aztecs, at least, through trade with tribes to the north, obtained supplies of turquois which came from the Cerrillos hills and perhaps other localities of the Southwest.

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¹ In the development of the color-sense, blue is the last of the pure spectrum colors to be distinguished. (See Goldschmidt, *Ueber Harmonie und Complication*, Berlin, 1901, pp. 97-104.) The fondness for blue, once formed in primitive people, seems to be a strong one.